THE SKULLS OF DUCKS

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Several years ago a young man whose father belonged to a hunting club presented me with the heads of several different species of wild ducks. It seemed such a pity to discard these without putting them to some use, that I finally decided to preserve the skulls. A casual examination of these indicated that, on the basis of the forms of the lacrymals alone, the marsh ducks (Mallards) may be distinguished from the open water species (Scaups). This led to an examination of the remaining movable bones of the skull, in the expectation that they would yield further evidence of grouping. The results, though different from those expected, are so interesting that they are described in detail.

The two longest axes of each bone were measured, and recorded in millimetric fractions. (See Table I). The selection of axes, though more or less arbitrary, was made consistently; corresponding points were selected for measurement in all specimens. The measurements are represented in the figures, especially Figure 37, by the dotted lines. Each set of crossed lines represents the measurements of one bone; excepting the jugal and quadratojugal, which, for obvious reasons, were measured as one bone.

It was impractical to attempt the measurement of the cranial bones, in part because their curvature made determination of axes difficult, and also because the sutures between the cranial bones of birds are very indistinct.

Despite fundamental differences in form between the lacrymals of Mallards and Scaups, there is actually a graded series existing: from the terete lacrymal process of the Redhead to the expanded and very thin lacrymal process of the Green-winged Teal.

With the exception of the lacrymals, there is very little difference in the proportions of corresponding bones in the skulls of various species of ducks. In some cases the dimensions are also identical. The vomer is of equal size in several species; so also is the maxilla and the squamosal. The set of bones exhibiting the greatest variation in this respect are the jugal-quadratojugals.

To continue briefly a comparison of certain bones: the fractional index for the articular of the Mallard is 10/10: for the Black Duck it is 11/12; for the Green-winged Teal it is 6/6; for the Blue Goose it is 12/14. It is of interest that the index of this bone is identical (10/10) for the Lesser Scaup, Ringneck, Redhead, and Mallard.

TABLE 1. Measurements of the Skull Bones of Ducks. Denominators indicate the longest axes; numerators the second longest axes. Numbers represent millimeters.

	Premaxillary	Maxillary	Nasal	Lacrymal	Vomer	Palatine	Prevomer	Squamosal	Quadrate	Pterygoid	Jugal-Quad-Jugal	Dentary	Splenial	Angular	Articular	Ocular Orbit
Lesser Scaup	13/30	6/30	6/9	10/15	4/18	6/22	7/10	20/20	9/11	4/11	2/30	4/40	4/22	6/33	10/10	15/20
Ringneck	13/30	6/30	6/8	10/15	4/15	5/17	4/12	18/18	9/12	3/10	2/34	4/40	4/15	5/32	10/10	15/18
Redhead	10/30	7/30	6/9	11/16	4/15	3/10	5/15	20/20	5/6	4/15	2/40	4/22	2/13	2/9	10/10	15/20
Mallard	5/9	8/40	9/14	15/25	4/20	6/27	5/20	23/25	10/15	4/15	1/20	4/60	2/25	3/20	10/10	18/22
Black Duck	16/45	9/44	10/14	16/25	4/20	7/25	5/20	25/25	10/15	4/12	2/45	5/60	6/20	4/21	11/12	17/20
Green-winged Teal	8/17	6/30	6/10	10/15	2/15	3/20	3/10	15/20	8/10	3/8	1/30	3/40	2/15	5/30	6/6	14/18
Blue Goose	8/30	6/30	9/10	15/15	5/15	10/30	5/15	25/30	10/15	5/15	2/40	4/60	5/20	7/40	12/14	17/20
Red-breasted Merganser	4/30	2/15	6/6	10/10	3/15	4/20	3/10	18/20			2/30	3/45	4/15	6/36		15/18
Pintail	12/35	7/40	9/12	15/20	4/20	4/25	5/20	20/23	10/12	3/12	2/42	4/55	5/20	7/45	10/10	

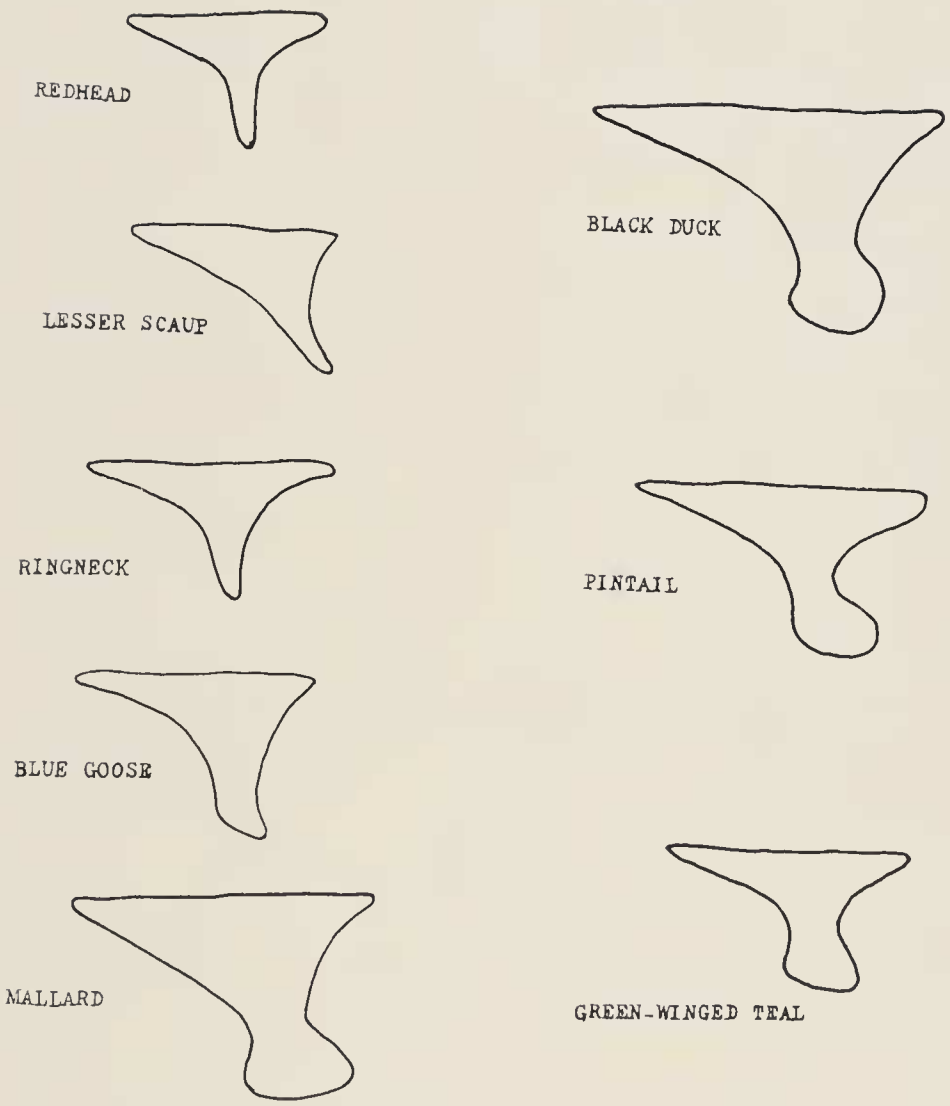

Fig. 36. Outlines of the lacrymal bones in various species of ducks.

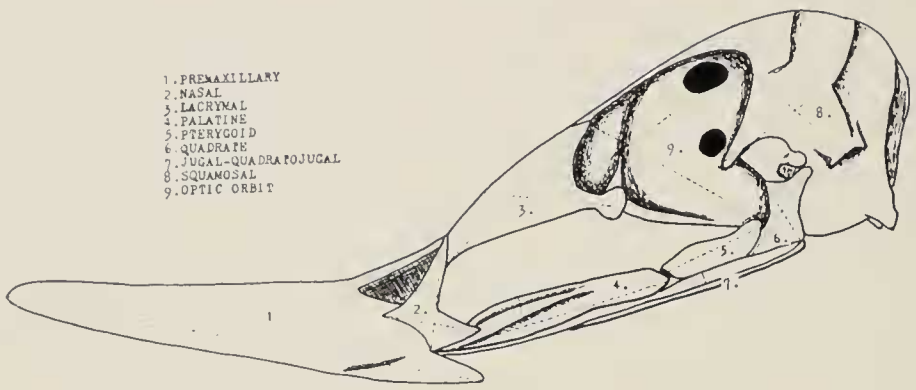

FIG. 37. Left lateral aspect of the Pintail skull.

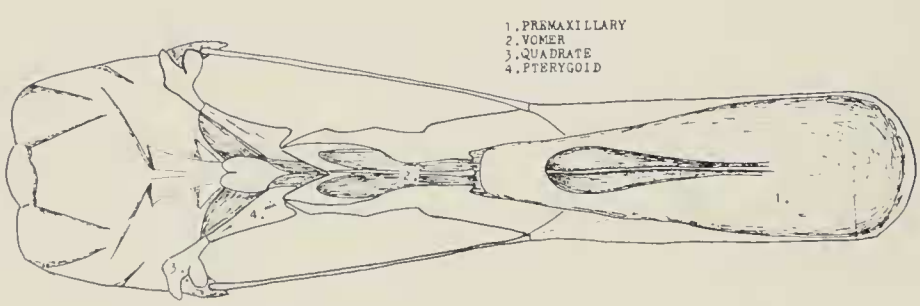

FIG. 38. Ventral aspect of the Pintail skull.

FIG. 39. External lateral aspect of the lower mandible of the Pintail skull.

Correspondence in the dimensions of the bones in various species follows no definite classification. It certainly does not correspond with taxonomic relationships: not even with similarities in other bones. Thus the prevomer of the Mallard and the Black Duck both have the index 5/20, but so does the Pintail; while that of the Teal is 3/20!

The similarity in form and dimension in the movable bones of the skulls of various species of ducks is probably due to the interrelationships of these parts. The living bird is able to flex the upper mandible, thus increasing the size of the mouth opening. This ability also enables the duck to work limnaceous material through the mouth. The action may be duplicated in a wet skull by holding the cranium firmly in one hand and flexing the premaxillary with the other. It may then be observed that during this action the quadrates rotate forward and upward; the jugal-quadratojugals, together with the palatines, are pushed forward; the palatines are moved forward by the pterygoids; these last two pairs of bones sliding their ental processes along the vomer and the bases of the interorbital processes. This action, by forcing forward the prevomer and maxillaries, raises the mandible.

It is obvious that this mechanism must be delicately adjusted, and hence, probably, the correspondence of its parts in different species of ducks.

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